

CLAIMS

What is claimed is:

1. A growth factor composition comprising:
 - a polypeptide of the TGF- β superfamily, and
 - a carrier comprising a vinyl pyrrolidone polymer having a molecular weight of from about 2.5 kD to about 20 kD, and a solvent selected from the group consisting of water and aqueous buffer solutions.
2. The composition of claim 1, wherein said vinyl pyrrolidone polymer is a polymer of N-vinyl-2-pyrrolidone.
3. The composition of claim 1, wherein said vinyl pyrrolidone polymer is a homopolymer of N-vinyl-2-pyrrolidone.
4. The composition of claim 1, wherein said vinyl pyrrolidone polymer is povidone.
5. The composition of claim 1, wherein said vinyl pyrrolidone polymer solubilizes said growth factor.
6. The composition of claim 1, wherein said vinyl pyrrolidone polymer is water soluble.
7. The composition of claim 1, wherein said vinyl pyrrolidone polymer is provided at a concentration of from about 0.1% weight/volume to about 70% weight/volume.
8. The composition of claim 1, wherein said vinyl pyrrolidone is provided at a concentration of from about 0.1% weight/volume to about 50% weight/volume .
9. The composition of claim 1, wherein said vinyl pyrrolidone polymer is provided at a concentration of from about 0.1% weight/volume to about 55%.
10. The composition of claim 1, wherein said vinyl pyrrolidone polymer is provided at a concentration of from about 0.5% weight/volume to about 2.5%.
11. The composition of claim 1, wherein said vinyl pyrrolidone polymer is provided at a concentration of about 1% weight/volume.
12. The composition of claim 1, wherein said polypeptide of the TGF- β superfamily comprises a Bone Morphogenetic Protein.

13. The composition of claim 1, comprising at least two growth factors selected from the group consisting of BMP-2, BMP-3, BMP-4, BMP-5, BMP-6, BMP-7, TGF- β 1, TGF- β 2, TGF- β 3, and FGF-1.
14. The composition of claim 1, wherein the mixture comprises a growth factor selected from the group consisting of IGF-1, EGF, HGF, TGF- α , and PDGF.
15. The composition of claim 1, wherein the composition comprises BMP-2, BMP-3, BMP-7, TGF- β 1, TGF- β 2, and FGF.
16. A method for inducing angiogenesis in a patient comprising:
 - providing a growth factor composition comprising a polypeptide of the TGF- β superfamily and a carrier comprising a vinyl pyrrolidone polymer having a molecular weight of from about 2.5 kD to about 20 kD and a solvent selected from the group consisting of water and aqueous buffer solutions; and
 - administering the growth factor composition to a patient in need of angiogenesis.
17. The method of claim 16, wherein the patient is human.
18. The method of claim 16, wherein said step of administering comprises injecting the composition into the patient's body.
19. The method of claim 16, wherein said step of administering comprises injecting the composition into the patient's heart.
20. The method of claim 16, wherein said step of administering comprising administering the composition subcutaneously.
21. The method of claim 16, wherein said step of administering comprising administering the composition intramuscularly.
22. The method of claim 16, wherein said step of administering comprising administering the composition intravenously.
23. A method for treating ischemic tissues, comprising:
 - providing a growth factor composition comprising a polypeptide of the TGF- β superfamily and a carrier comprising a vinyl pyrrolidone polymer having a molecular weight of from about 2.5 kD to about 20 kD and a solvent selected from the group consisting of water and aqueous buffer solutions; and

administering the growth factor composition to the ischemic tissue.

24. The method of claim 23, wherein the ischemic tissue is myocardial tissue.
25. The method of claim 24, wherein said step of administering comprises injecting the composition into the myocardial tissue.
26. The method of claim 25, wherein the composition is a liquid having a viscosity of less than about 3 cP.
27. The method of claim 25, wherein the composition is a liquid having a viscosity of less than about 2.5 cP.
28. The method of claim 25, wherein the composition is a liquid having a viscosity of less than about 2 cP.
29. The method of claim 25, wherein the composition is a liquid having a viscosity of less than about 1.5 cP.
30. A method of promoting soft tissue regeneration in a living subject, comprising:
 - providing a growth factor composition comprising a polypeptide of the TGF- β superfamily and a carrier comprising a vinyl pyrrolidone polymer having a molecular weight of from about 2.5 kD to about 20 kD and a solvent selected from the group consisting of water and aqueous buffer solutions; and
 - administering the growth factor composition to the soft tissue.
31. A method for increasing the bioavailability of a growth factor, comprising the steps of:
 - providing a growth factor comprising a protein of the TGF- β superfamily disposed in an aqueous medium comprising a solvent selected from the group consisting of water and aqueous buffers; and
 - adding a vinyl pyrrolidone polymer to the medium.